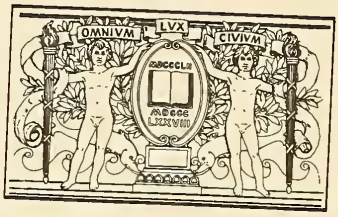
BOSTON PUBLIC LIBRARY
3 9999 06588 460 1

A
m3/B16
TP
89/1



BOSTON
PUBLIC
LIBRARY

Digitized by the Internet Archive
in 2011 with funding from
Boston Public Library

http://www.archive.org/details/transportationst00bost

Transportation Strategies for the Back Bay

Key Project Findings

BOSTON PUBLIC LIBRARY
GOVERNMENT DOCUMENTS DEPARTMENT
RECEIVED
DEC 5 1989

MB/B16
TP
89/1

Boston Transportation Department

June, 1989

assistance from:

Cambridge Systematics Inc.

Howard/Stein-Hudson Associates

Bruce Campbell and Associates

CBT/Childs Bertman Tseckares and Casendino Inc.

Introduction

This report presents the major findings of the Transportation Strategies for the Back Back project. This represents the completion of the first phase of the project which included three major technical tasks:

- Review Previous Transportation Work for the Area
- Identify Current Transportation Problems
- Undertake New Data Collection Programs

Since the Fall of 1988, the Boston Transportation Department along with the Project's Working Committee and its consultants have undertaken a comprehensive review of transportation conditions and issues throughout the Back Bay.

Reviewing Previous Transportation Work included reviewing 28 previous and on-going transportation related studies within the Back Bay. In addition to reviewing these studies to identify useful data that may be available, a second objective included identifying their objectives, and related issues or controversies that may have been caused by the study.

Identifying Current Transportation Problems involved an on-going program of meeting with the Working Committee members to focus properly on issues of major concern, meeting with members of the study area neighborhood associations and business community to elicit their concerns, and an analysis of the technical data.

New Data Collection Programs were initiated when existing data were deficient or lacking and where the Working Committee determined that such information would be important to resolve issues.

A variety of technical tools and methods were used in these programs. A sample of these methods include traffic flow condition surveys for all study area streets, time lapse photography, on-street curb and double-parking surveys, analysis of the impacts of special events on traffic, Green Line (MBTA) occupancy and line operation survey, and employer traffic mitigation program surveys. Much of the information was collected for weekday and weekend conditions.

A summary of the key technical findings are included in the next several pages. The results are listed by five general categories:

1. Traffic
2. Parking
3. Special Events
4. Transit
5. Pedestrian

Summary of Technical Findings

1. Traffic

1. Peak hour traffic volumes are generally highest in the morning (weekday am), about 7% lower during the afternoon (weekday pm), and about 16% lower (compared to the weekday am) during the Saturday peak hour, which occurs about 3 to 4 pm.

2. Although Saturday peak hour traffic volumes are consistently lower than weekday peak hour traffic, all day traffic counts on streets such as Newbury and Boylston are consistently higher on Saturday than on weekdays.

3. Roadway travel speeds often have little relationship to traffic volumes. Saturday travel speeds are considerably lower than weekday am or pm peak periods, although traffic volumes for Saturday are lower, as summarized above. Roadway speeds on Saturday (9.1 mph overall for both north-south and east-west streets) average 72% of the Weekday AM (12.6 mph overall) and 95% of the Weekday PM (9.5 mph) speeds. For the streets running north-south such as Arlington, Berkeley, Clarendon,etc., the differences in speed are more pronounced with the Saturday speed (7.4 mph) only 60% of the weekday AM (12.2 mph) and 92% of the weekday PM (8.1 mph).

4. When traffic conditions are measured at intersections, using standard traffic engineering analysis methods, generally good ratings or levels of service are indicated for most intersections throughout the study area. These conditions, based on the standard level of service rating method, fall within the range of A, B and C ,i.e., generally good intersection conditions for peak travel periods. This method is affected primarily by numbers of vehicles.

5. When traffic conditions are measured at the roadway scale of analysis, generally much poorer conditions are indicated. This method considers the entire street environment as factors affecting mobility and includes such considerations as pedestrians crossing at intersections and midblock, vehicles parking along the curb, double parking, the frequency of traffic signals along the street, and the coordination of these signals to each other. These factors can impede mobility more seriously than the volume of traffic at a particular intersection would normally indicate.

   Roadways during the weekday AM peak hour average a rating (level of service) of about D+ (marginal). However, during the weekday PM peak hour and Saturday peak hour periods, ratings of D- are indicated. Although both the PM and Saturday periods handle less traffic, the effects of the roadway factors described above clearly have a serious impact on the roadway level of service.

6. North-south oriented streets (Arlington, Berkeley, Mass. Ave., etc.) have poorer levels of service than the east-west streets (Beacon, Boylston, Huntington, etc.) The lower level of service is caused by shorter signal spacings, generally less green to cycle times, and greater impacts due to pedestrians and vehicle parking. North-south streets average ratings of D+, E, and E- (poor) for the AM, PM and Saturday periods, respectively.

7. A single 80 second "midday" traffic signal dial is used throughout the day on Saturday. The east-west streets are given the (green) time allocated for pedestrians when the pedestrian phase of the signal is not actuated. This "extra" time improves east-west mobility although the north-south streets have higher traffic volumes and generally more factors that impede mobility.

8. The use of time lapse photography indicates driver habits are different on Saturday compared to weekdays. For example,

   At the Berkeley Street on-ramps to Storrow Drive, it was observed that Saturday (peak period) drivers use one lane to access the eastbound on-ramp and one lane to access the westbound on-ramp. During the weekday PM peak period, it was observed that vehicles entering Storrow Drive form a second lane to turn right onto the eastbound on-ramp, allowing the ramp to accommodate more vehicles.

   Saturday auto speeds are lower by about 30% on sections of Newbury Street and Boylston Street where no double parking existed or any other factor visible that would affect mobility.

2. Parking

Non-Residential Areas

1. On-street parking spaces with meters number about 1,250 in the study area.

2. On-street parking approaches 100% of capacity at noon, although some metered spaces can usually be found north of Commonwealth Avenue.

3. Weekday long term parking (six or more hours) is considerable on streets that were surveyed (Newbury, Boylston, Clarendon and Dartmouth). By 9 or 10 am, from 40% to 50% of all metered spaces surveyed on Newbury, Dartmouth, Boylston and Clarendon Streets were taken by a long term parker. These spaces were used an average of 8.5 hours by the same vehicle. None of the long term vehicles had residential parking stickers.

4. Saturday long term parking involves the same proportion of metered spaces as weekdays. However, the time that a space is used by the same vehicle is longer than for weekdays, averaging 9.5 hours.

5. "Feeding the meters" to extend the maximum legal parking limit of 2 hours per vehicle (1 hour on the north side of Boylston Street) was identified for about 50% of all vehicles parked longer than the meter limit.

6. Meter space turn-over on Newbury Street averages about 3.3 vehicles per day for spaces used by at least one long term parker. Meter space turnover averages 6.8 vehicles per day for spaces used legally, i.e. no meter feeding or no parked vehicle exceeding the time limit.

7. Long term meter parking considerably reduces parking opportunities for legal short-term parking in the study area. Based on the current profile of parking on Newbury Street, daily short-term meter parking capacity would be increased 35% without the long term parkers.

8. Double parking is prevalent both weekdays and Saturdays on Boylston and Newbury streets. Time lapse photography indicates that double parking represents over 40% of all vehicles parked on these streets during a 12 hour survey period (7 am to 7 pm).

9. Double parking normally is short-term. During weekdays, it averages 8 to 10 minutes per vehicle. However, Newbury Street on Saturday averages 25 minutes per double parked vehicle.

10. Over 60% of all vehicles using loading zones on Clarendon and Dartmouth Street did not have commercial license plates. On Newbury street, 50% of all vehicles parked in the loading zones remained over 2 hours.

11. The number of public and private off-street parking spaces in the study area has increased during the 1980's. Public off-street parking has increased by 1,000 spaces or by 14%, primarily in Copley Square. Private off-street parking (residential, office or retail uses) has increased greatly, from 3,250 spaces in 1982 to 6,200 spaces in 1989 an increase of 91%. Overall, the current supply of off-street parking in the study area includes 8,730 public spaces and 6,200 private spaces, a total of 14,930 spaces.

12. Average weekday and Saturday accumulation counts for several off-street parking garages in the study area show spaces are available, especially on Saturday. The Motor Mart, Copley, 500 Boylston and Prudential garages average peak accumulations of 80% of capacity on weekdays. Maximum accumulations on Saturday averages 60% of capacity (no data for the Prudential).

Residential Areas

1. Auto ownership in the study area has risen 52% from 1980 to 1987, an increase of 2,150 automobiles. Automobile ownership in the study area in l987 averaged 0.72 autos per household, up from 0.47 autos per household in 1980. The citywide average in 1987 stands at 0.97 autos per household (0.78 in l980).

2. Based on a 1986 survey, 2,370 autos (37% of all autos owned) are parked on-street, the approximately 3,900 other autos (63%) owned in the study area are parked off-street in garages, lots or in alleys.

3. About 1,475 on-street parking spaces are designated for Resident Permit Parking spaces. This provides for 62% of the estimated 2,370 autos that park on-street (1.6 autos/space).

4. An estimated 5,000 resident stickers have been issued, representing 80% of the total (6,300) number of autos owned in the study area.

5. A recent survey conducted in the abutting Ellis neighborhood in the South End showed that 55% to 60% of all vehicles parked on-street were not used for daily commuting to work.

3. Special Events

Outdoor Events

1. Outdoor events reviewed included road races, walkathons and street fairs that are granted permits by the City of Boston.

   The number of road races, walkathons and street fairs in the study area has been increasing by 15% to 20% per year (7 to 8 events) since 1986, with 57 major outside events having occurred in 1988.

2. In 1988, the breakdown of outdoor events by type was 19 (33%) road races, 24 (41%) walkathons and 14 (26%) street fairs.

3. In 1988, 17 (30%) were on weekdays, 19 (33%) were on Saturday and 21 (37%) were on Sunday.

4. In addition to having more outdoor events overall in the study area, the trend is for more of these events to occur on Saturday and on weekdays, especially involving corporate employee road races. Saturday road races, walkathons and street fairs (for the peak six month period) increased to 15 major events, while Sunday remained stable with 17 events. The Saturday events are of longer duration and shorter in length (use fewer streets in the study area) than in previous years. However, more heavily travelled streets are now used.

5. Over 80% of the annual total number of outside major events occur during the six spring and fall months of April, May, June, September, October and November.

6. Of the 26 weekends comprising the peak six month period in 1988, 8 weekends (30%) had no events, 11 weekends had 1 event, 3 weekends had 2 events, 3 weekends had 3 events and 2 weekends had 4 events.

7. The typical weekend event in 1988 started in the midmorning (10 to 11 am), lasted 2 to 4 hours, included 2,000 to 5,000 participants, and involved 6 to 15 street blocks of the Back Bay.

8. A typical Saturday during the peak six month Spring and Fall seasons would include at least one major outdoor event -more likely a walkathon lasting about 2 hours, starting about noon, including 7 or more local streets and involving over 6,000 people).

9. A Saturday walkathon along Arlington Street and the Boston Common (April 29, 1989), involving 2,000 participants, starting at noon and lasting 2 hours, was tested to identify its possible impact on area traffic. An analysis of traffic flow data obtained

for that day indicated travel speed on area streets (Beacon, Arlington, Stuart and Boylston Streets), was 14% lower than other Saturdays with no events.

Indoor Events-Conventions and Major Meetings

1. 193 conventions and major meetings are scheduled in the study area during 1989. This is about the same number of total indoor events as for 1988.

2. The Hynes Convention center represents 30% (58) of the total number of annual events (193). All other conventions (70% or 135) are held at several of the major hotels in the Back Bay, notably the Sheraton (59), Park Plaza (43) and Marriott (41).

3. Most of the scheduled conventions are relatively small. Almost one-half of the total number of conventions (96 of 193) average under 1,000 participants, 53 conventions involve 1,000 to 3,000 participants, 27 conventions involve 3,000 to 8,000 participants, and only 17 (9%) involve more than 8,000 participants.

4. National and international conventions represent the majority type of meeting with 67% (130) of all conventions, state and regional conventions represent 22% (42), local corporations represent 4% (8) , and gate shows 7% (13).

5. March, April, May, June, September and October represent the peak period to have a convention, averaging almost 25 conventions per month.

6. A survey of a major national convention at the Hynes (National League of Cities with over 10,000 participants-12/1988) showed that automobile use was very low, with under 1% of respondents using an automobile daily to access the convention and about 4% using an automobile (mostly rentals) for non-convention activities such as sight-seeing, dining, etc. For 42% of respondents, this was their first visit to Boston.

7. Two major conventions held in April, 1989 at the Hynes Convention Center and involving a national convention of over 9,000 participants and a gate show involving over 10,000 participants were tested to identify their possible impact on area traffic. An analysis of traffic flow data obtained for each convention for a Saturday was used to identify impacts caused by these conventions on selected streets (Boylston Street, Huntington Avenue, Massachusetts Avenue). The data showed no indication of impact by the national convention, i.e., compared to Saturdays with no special events or very small events, roadway travel speeds were within the normal range of traffic variability. However, for the gate show, surrounding roadway speeds averaged 35% lower than other Saturdays with no events.

4. Transit

Service Issues

1. Transit service in the study area includes the Green Line, Orange Line, commuter rail system, MBTA bus routes (express and local) and several private bus carriers from the west and south.

2. The use of transit by commuters to access the study area has increased, primarily due to the Back Bay Station. Overall, the transit share for commuting to work in the study area now stands at 46%. In 1980, the share was estimated at 43%. This increase represents 1,500 new transit users. Much of this increase was caused by the improved access to the study area afforded by the Back Bay Station.

3. In addition to 46% of commuters using transit, 12% currently rideshare (2+ riders), 8% walk and 34% drive alone to access the the study area.

4. The transit mode used to access the study area is 35% of total transit by the Green Line, 27% by the Orange Line, 17% by commuter rail, 14% by MBTA bus and 7% by private bus.

5. The Back Bay Station handles 10,000 Orange Line users and 5,000 commuter rail users daily. During the morning peak hour, 2,200 Orange Line users and 2,000 commuter rail users are arriving at the station to access the study area. In addition, 2,800 other commuter rail riders arriving at the Station during the morning peak hour transfer within the station to the Orange Line to access the downtown.

6. The Orange Line has attracted riders to the Back Bay from the Green Line. A review of current and historical data indicates that about 5% of former morning peak period users of the Green Line have switched to the Orange Line. Peak hour ridership (one way) on the Green Line now averages about 8,600 to 8,900.

7. The arrival of the new Green Line (Type 7) vehicles allows for ample capacity on the Green Line. Overall AM and PM peak hour volumes to capacity now average from 70% to 75% of practical capacity, a considerable improvement over the past 10 years.

8. Field surveys on the Green Line indicate that crush capacity conditions (180 passengers per car) generally no longer occur, even by branch. Sufficient equipment is provided during peak periods to allow freedom of access to all branches of the Green Line at any time. Observed headways ranged from 3 minutes during the AM on the Riverside (D) Line to 7-8 minutes on the Huntington Ave (E) Line. Total (observed) train movements in the central subway result in headways of 63 seconds in the AM and 75 seconds in the PM.

9. Maintaining evenly spaced trains on the Green Line remain a problem on all branches, with time between train arrivals showing little relationship to the overall average headway. However, because much more equipment is now assigned to each branch, long time gaps between trains on a branch no longer occur frequently.

10. The 50 to 55 trains using the Green Line central subway in each direction during the peak hour result in considerable bunching. This common occurrence results in considerable on-board delays to passengers, with trains making frequent stops between stations.

11. The southside commuter rail service to the Back Bay has been expanding to keep pace with demand. The current problem is insufficient equipment to keep pace with

increases in ridership. Standees are common for trains departing the station in the afternoon and arriving in the morning. However, new equipment expected over the next two years should mitigate this problem.

12. Inadequate commuter parking at outlying locations is a major problem for both the rapid transit and commuter rail systems. A separate study by the City of Boston shows virtually all available commuter parking facilities are filled by early morning. This same study indicates that although the MBTA is currently committed to construct an additional 2,900 spaces, demand will require another 13,000 spaces by 1995.

13. Nine private bus companies from the south and west provide direct service to the study area, primarily to the Park Square area. About 156 bus trips are made to the study area daily, over 100 trips arrive during the morning peak period (6:30 to (9:00 am). Most of these trips also serve the downtown area (primarily South Station).

14. The private carrier bus routes primarily are well utilized with an average ridership per bus of 35 riders during the peak periods (80% of the bus seating capacity) and 28 riders during the midday period (65% of the bus seating capacity. About 35% to 40% of the total ridership is estimated by the carriers to be destined to the study area.

15. Over 80% of all the private bus carrier trips arrive from the south and use the Southeast Expressway. The private carriers from the south have said that congestion on the Expressway adds an average of 15 to 20 minutes to each trip during peak travel times. In addition, travel between the study area and South Station has also been mentioned by the owners as poor, and severely limiting the number of trips that they are willing to schedule to serve both locations.

Transportation Marketing and Management Issues

1. The total employment of the study area is estimated at 56,230 (1985) including 1,757 total companies, stores, etc. The distribution of this employment includes 45% in the service sector, 18% in finance, 14% in retail, 9% in utilities and 14% in other sectors.

2. The 11 largest companies (ranging in size from 1,100 to 5,500 employees) represent 35% of the total employment of the study area.

3. A survey was conducted of companies in the study area to identify the number and type of transportation management (traffic mitigation) programs currently available.

   91 companies currently participate in the MBTA monthly pass program, i.e., automatic payroll deduction and delivery of a transit pass. Although this number represents only 5% of the total number of companies, it includes 9 of the 11 largest companies, and represents coverage for nearly 50% of the total employment of the study area. Almost 8,300 monthly passes are distributed through this program, 31% of the total employees covered.

   Very few companies provide a transit subsidy of any kind. Under 1% of the companies covering 4% of the study area employment offer any amount of transit subsidy.

A subsidized ridesharing program covers 9% of the employment of the study area. The program is currently offered by a few very large firms, who consider the program part of their overall employee benefit package. The subsidy amount covers an average of 65% to 85% of the monthly cost for a parking space. Most of these programs provide rider matching assistance and corporate arrangements with specific garages. (About 12% of the employment of the study area is offered a subsidized off-street parking space. The subsidy ranges from 40% to 100% of costs.)

4. A survey of several companies was undertaken to identify a relationship between transit/auto subsidies offered by the employers and automobile use by employees. Although the sample size was small, companies providing a parking subsidy for a substantial percentage of its employees had a minimum of 50% of its employees driving alone. For the average company in the study area, an employer providing no transportation subsidy (transit or automobile), about 34% of its employees drive alone. For the company offering subsidized ridesharing (automobile or van) and the MBTA monthly pass program, about 22% of its employees drive alone.

5. Except for several very large companies, almost 50% the of employees in the study area work for very small firms, averaging 16 employees. It is unlikely that these firms have the resources to provide transportation subsidy or management programs alone.

5. Pedestrian Issues

1. Pedestrian crossings at many Intersections are made difficult due to the confusing layout (geometry) of the intersections. Example intersections that need to be looked at include:

   Arlington/Beacon
   Arlington/Columbus/Stuart
   Berkeley/Beacon
   Dartmouth/Huntington/St.James
   Dartmouth/Boylston
   Huntington/Exeter
   Huntington/W. Newton
   Huntington/Massachusetts Ave.
   Massachusetts Ave./Newbury
   Park Plaza Area (Charles, Stuart, St. James)

2. At many intersections, such as those along Newbury Street, automobiles illegally park near or within the pedestrian crosswalk areas which severely restricts the motorist's visibility of the pedestrian.

3. Street furniture is sited poorly at many locations. Such items as sign posts, trash receptacles, mailboxes, paper stands, etc,) are located haphazardly without consideration to pedestrian mobility and safety. This condition is a particular problem at the intersections where pedestrian volumes are highest. Poor furniture siting encourages pedestrians into the street, reducing pedestrian safety and impeding vehicular flow. Street

vendors also contribute to pedestrian mobility problems when they locate at public stairways (MBTA entrances) and within the middle of sidewalks.

4. More consistent application in the design, location and use of materials are warranted.

   Pavement materials are poor in many places, particularly the use of brick. Other examples include poor surfaces at handicapped ramps and the use of slippery pedestrian crossing material.

   Tree plantings on narrow sidewalks without the use of properly designed metal grates too often restrict flow.

   Planter boxes and cafe tables are many times located in the path of pedestrians, particularly on Newbury.

   Sidewalks and alleyways are often at different levels, which impedes mobility.

5. Several heavily travelled pedestrian corridors in the study area do not emphasize enough the pedestrian orientation of the corridors. These areas include Dartmouth Street between the Back Bay Station and Boylston Street, and many sections of Boylston Street and Newbury Street.